

# B R E V I O R A

## Museum of Comparative Zoology

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CAMBRIDGE, MASS.

DECEMBER 19, 1958

NUMBER 99

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### A NEW SUBSPECIES OF *CHAMAELEO JACKSONI* BOULENGER AND A KEY TO THE SPECIES OF THREE-HORNED CHAMAELEONS

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A small collection of reptiles collected on Mt. Meru, Tanganyika Territory, in August 1956, by Lt. Col. J. Minnery was sent to the Museum of Comparative Zoology by Mr. C. J. P. Ionides. It included three male chamaeleons that Mr. Loveridge believed to represent a new form but did not describe since he desired to confirm the characters on a large series. Fourteen additional specimens were obtained through Mr. Ionides in 1957 and seven in 1958 after Mr. Loveridge had retired as Curator of Herpetology. Five of these last have been sent to the British Museum (Natural History). These twenty-four specimens, together with an additional one already in the collection of the Museum of Comparative Zoology, form the basis on which the following form is described. (The name has been suggested by Mr. Loveridge.)

#### *CHAMAELEO JACKSONI MERUMONTANA* subsp. nov.

*Type.* A male, Museum of Comparative Zoology No. 56152 (collector's No. 7651), apparently adult, collected at Laikinoi, near Arusha, Mt. Meru, Arusha District, Northern Province, Tanganyika Territory, at 7500 ft. alt., August 1957 by Lt. Col. J. Minnery.

*Paratypes.* Twenty-four. MCZ 44327, male, Mt. Meru, east at 9000 ft. alt., 1938, Cooper collector; MCZ 54790-92, males, same locality as type, August 1956, Lt. Col. J. Minnery collector; MCZ 56153-59, males and 56151, 56160-64 females, same data as type;

MCZ 56989 male and 56990 female, same locality as type, January 1958, Lt. Col. J. Minnery, collector; BM (5 specimens), same locality as type, January 1958, Lt. Col. J. Minnery, collector.

*Diagnosis.* A chamaeleon with three annulated horns in the male, closest to *Chamaeleo jacksoni* Boulenger, but differing from it in smaller size, in having the occipital and postorbital areas covered with smooth or weakly convex scales (rather than strongly convex scales) and in having fewer and larger scales between the preocular horns.

*Description.* Three annulated horns, one rostral and two preocular in position and subequal in length. (In males only, females with only a rostral horn, proportionately shorter and with two sharp horn scales instead of the preocular horns.) Preocular horns arising from the anterior end of the raised supraorbital ridges and separated by a mosaic of enlarged flattened scales, a few of them with antero-posteriorly oriented ridges. (This ridging is more marked in some of the paratypes than in the type.) The minimum number of scales counted between the preocular horns (males) or horn scales (females), 7 in the type, 6 or 7 in the paratypes (see table below).

The supraorbital ridges continued posteriorly as low ridges to the posterior border of the head, separating the posterior dorsal and lateral head scales into postorbital and occipital areas. These areas are covered with enlarged scales, some of which are flat and others weakly convex. (The number of completely flat scales in these regions varies in the paratypes but never are there many strongly convex scales present.)

A moderately low curved profile to the casque; a parietal crest present, two or three scales high, forked anteriorly to form low ridges that extend antero-laterally toward the supraocular ridges, but do not meet them. These branches of the parietal crest separate the large flat occipital scales from an area of small strongly convex scales that are distinct from both the occipital scales and the interorbital scales anterior and lateral to them.

No occipital lobes; a very low ridge marking the posterior border of the casque and separating the head scales from the smaller nape scales.

Small, soft, triangular tubercles on the upper portion of the eyelid.

A median dorsal crest of enlarged scales extending from the shoulder region nearly to the base of the tail, these trianguloid scales largest and most pointed anteriorly, becoming smaller and more rounded posteriorly, separated by one to four scales. In some cases the small scale immediately in front of the large one is distinctly larger than the others but it never approaches the largest in size or shape. No crest on the tail.

The scales on the rest of the dorsal and lateral surfaces markedly heterogeneous in size on both body and tail, with an irregular arrangement of large flat scales among small granular ones and intermediates in size and convexity. The dorsal surfaces of the limbs similarly scaled but with large plates predominating, particularly on the forelegs.

The ventral surface covered by uniform granules with some very tiny ones between them, except for the sides of the throat where there are elongate patches of the very small granules. No gular or ventral crest evident.

Color (in alcohol) : The horns, the interorbital and snout scales, the supraorbital ridges, and the anterior enlarged dorsal crest scales light brown. The rest of the animal blue, lighter dorsally and on the head, limbs, and tail and darker on the lips, sides of throat and sides and venter of the body. (All the male paratypes show this distribution of light yellow brown but vary in the intensity of blue on the rest of the body. The females are blue with the rostral horn dark brownish.)

Measurements: See Tables 2 and 3.

*Discussion.* The Mt. Meru specimens described above are most similar to *Chamaeleo jacksoni* Boulenger which was described from Nairobi. However, they differ in a number of respects. The comparison below is based on eighteen adult specimens of the typical race from various localities in Kenya Colony.

The most striking difference is the small size of the Mt. Meru series. The largest male measures 91 mm. in snout-vent length, the largest female 86 mm. In the Kenya series of eighteen, eleven measure 97 mm. or over, snout-vent length. The largest male is 167 mm., the largest female 140 mm.

In *merumontana* the occipital and postorbital scales are flat or a few of them weakly convex, giving a smooth appearance to the occipital and postorbital areas. In the Kenya specimens many

of these scales are strongly convex giving a bumpy appearance to these areas.

In the Mt. Meru series, the scales between the preocular horns (interorbital scales) are larger and fewer in number than in the Kenya specimens. The table below shows the specimens arranged according to the *least* number of scales counted between the horns.

TABLE 1  
SCALES BETWEEN PREOCULAR HORNS OR HORN SCALES

Numbers of scales		6	7	8	9	10	11	12
Number of specimens with each scale count	Mt. Meru	8	17	0	0	0	0	0
	Kenya	0	1	3	8	5	0	1

In the Mt. Meru series the large flat interorbital scales (some of them sometimes having a median keel) differ sharply from the more posterior small strongly convex scales between them and the branches of the parietal crest. In the Kenya specimens the interorbital scales do not differ markedly from the scales behind them.

In the Kenya specimens the dorsal crest is formed by groups of two scales, the first of which is smaller than the second, but both are larger than the scales between groups, and both are pointed — at least in part. The enlargement of the anterior scale is much less evident in some of the smaller specimens. In the Mt. Meru specimens the anterior scale in each group is relatively smaller. It is usually but little larger than the surrounding scales, so that the crest seems to be composed of single, isolated, enlarged scales.

The ridges on the head of the Kenya form are more distinct than those of the Mt. Meru series. This is particularly true of the ridge along the posterior border of the casque and the anterior branches of the parietal crest. The more marked parietal crest gives a noticeably higher profile to the casques of the large males from Kenya.

The body scales of all of the specimens are markedly heterogeneous. The two forms differ only in that the large scales tend to be flatter in the Mt. Meru specimens than in the Kenya specimens.

In seven of the eight Mt. Meru females the rostral horn is well developed, although shorter than that of a male of equivalent size. The eighth female has a very small rostral horn, and none has preocular horns. In the six large Kenya females, one has both rostral and preocular horns developed. In the other five the preocular horns are 2 mm. or less. Three of these have a rostral horn and two have only a sharp rostral scale.

Loveridge, 1957, gives the range of *Chamaeleo jacksoni* as "Highlands of Kenya Colony and Tanganyika Territory." Apparently his inclusion of Tanganyika was based on the MCZ specimen No. 44327 from Mt. Meru, listed here as a paratype of *C. j. merumontana*. No other specimens or records of *C. jacksoni* from Tanganyika have been located. Therefore, the range of *C. j. jacksoni* can be restricted to the highlands of Kenya Colony, and that of *C. j. merumontana* can be given as Mt. Meru, between 7500 and 9000 ft. alt.

Of the type and those paratypes collected by Lt. Col. J. Minnery, C. J. P. Ionides writes: "They are found on bushes and in low small trees. Laikinoi is a farm on the very edge of the rain forest." (Letter dated 5 December 1957.)

*Three-horned chamaeleons.* In the course of describing this form, specimens of the five other species of three-horned chamaeleons were examined. A few notes and a key for the identification of these species are included below.

The six species characterized by the possession of three annulated horns in the male do not seem particularly closely related. The other morphological characters that they have in common are negative rather than positive: lack of spurs in either sex; lack of axillary pockets.

Among them, *C. jacksoni* seems closest to *C. johnstoni* Boulenger, again primarily on negative characters: absence of occipital lobes, absence of a gular crest, absence of a dorsal fin, but also in the possession of heterogeneous body scales.

*C. wernerii* Tornier and *C. fulleborni* Tornier seem quite closely related to each other, though not to either *C. jacksoni* or *C.*

*johnstoni*. The only other close relationship involving these species seems to be between *C. johnstoni* and *C. ituriensis* Schmidt, the latter a hornless chamaeleon of the eastern Belgian Congo forest.

*C. oweni* Gray is widespread throughout the lowland rain forest in West Africa extending into eastern Belgian Congo. All the others are mountain forest forms in East Africa: *C. fulleborni* from the Ngosi Volcano, Poroto Mountains, Ukonde, Tanganyika Territory; *C. weneri* from the Uluguru and Uzungwe Mountains, Tanganyika Territory; *C. johnstoni* from the virgin forest of Uganda, Belgian Ruanda-Urundi and the adjacent Belgian Congo; *C. deremensis* Matschie from the Usambara and Uluguru Mountains, Tanganyika Territory; *C. jacksoni* from the highlands of Kenya Colony and Mt. Meru, Tanganyika Territory.

It is noteworthy that except in the Uluguru Mountains no two species of three-horned chamaeleons are known to occur together. This is evidence supporting the suggestion that the three horns serve these chamaeleons as a means of species recognition. The case of the two species occurring together on the Uluguru Mountains supports rather than contradicts this view. These two chamaeleons are very different in appearance. *C. deremensis* is large, laterally compressed and with a high dorsal fin; *C. weneri* is smaller and stocky with no dorsal fin. Even with the presence of three horns in both there could be little opportunity for confusion. In eastern Belgian Congo where a close relative of the three-horned *C. johnstoni*, *C. ituriensis*, occurs with the three-horned *C. oweni*, both species are similar in size and proportions, but *C. ituriensis* is hornless.

#### *Key to the three-horned chamaeleons*

1. High sail like dorsal fin ..... *C. deremensis*  
    No high sail like dorsal fin ..... 2.
2. Body scales equal in size or nearly so ..... *C. oweni*  
    Body scales differing markedly in size ..... 3.
3. Well developed occipital lobes ..... 4.  
    No occipital lobes ..... 5.
4. Occipital lobes continuous across back of casque as  
    a flap ..... *C. weneri*  
    Occipital lobes separated by a gap in the middorsal  
    region ..... *C. fulleborni*

5. Dorsal crest of much enlarged scales in groups of one or two ..... 6.  
 No dorsal crest of much enlarged scales ..... 7.
6. Occipital and postorbital scales strongly convex, scales between preocular horns smaller and more numerous (7-12), size larger ..... *C. j. jacksoni*  
 Occipital and postorbital scales flatter, scales between preocular horns larger and fewer (6-7), size smaller ..... *C. j. merumontana*
7. \*Dorsal profile of body smooth or undulating ..... *C. j. johnstoni*  
 Dorsal profile of body crenulated ..... *C. j. crenulata*
- \* *C. johnstoni crenulata* not seen, this section of the key taken from Laurent, 1951.

TABLE 2  
 MEASUREMENTS OF MT. MERU SPECIMENS

Museum Number	Sex	Snout-vent Length	Rostral horn Length	Preocular horn length	Head length (snout to end of casque)	Scales between preocular horns
MCZ 44327	male	68	13	11	22	7
54790	"	88	19	18	28	6
54791	"	76	16	14	24	7
54792	"	60	7	6	19	7
*56152	"	91	19	18	29	7
56153	"	73	18	18	24	6
56154	"	78	15	13	26	6
56155	"	75	16	15	25	7
56156	"	73	17	16	24	7
56157	"	90	20	16	29	7
56158	"	71	11	10	24	6
56159	"	64	10	8	20	7
56989	"	86	23	22	26	6
BM ———	"	78	17	15	26	7
———	"	82	16	15	24	7
———	"	57	9	7	19	7
———	"	79	14	13	25	7
56151	female	74	7	—	23	7
56160	"	77	7	—	23	6
56161	"	80	8	—	22	6
56162	"	81	8	—	25	7
56163	"	74	8	—	23	7
56164	"	86	6	—	26	7
56990	"	78	8	—	24	6
BM ———	"	79	2	—	24	7

\* Type of *C. j. merumontana*



TABLE 3  
MEASUREMENTS OF KENYA SPECIMENS

MCZ Number	Sex	Snout-vent length	Rostral horn length	Preocular horn length	Head length (snout to end of casque)	Scales between preocular horns
Embu District						
7842	male	110	15	15	35	9
7842	female	140	—	—	41	12
Meru						
11467	male	167	35	33	52	9
29454	"	118	22	22	41	10
Lukenya						
34995	female	99	7	—	31	10
34996	male	111	16	16	36	9
Parklands, Nairobi						
18365	male	98	15	13	30	9
18366	female	123	13	6	37	9
18367	"	97	5	2	29	8
31365	"	103	3	2	32	9
31366	"	105	—	—	31	8

#### LITERATURE CITED

BOULENGER, G. A.

1896. Description of a new chamaeleon from Uganda. *Ann. Mag. Nat. Hist.*, (6) **17**: 376.

LAURENT, R.

1951. Deux reptiles et onze batraciens nouveaux d'Afrique central. *Rev. Zool. Bot. Afr.*, **44**: 360-381.

LOVERIDGE, A.

1957. Checklist of the reptiles and amphibians of East Africa. *Bull. Mus. Comp. Zool.*, **117**: (2): 153-362, i-xxxvi.